LCD Module User Manual

Customer	:	
MASS PRODUCTION CODE	:	**TG240128D-01XA0**
DRAWING NO.	:	**m-TG240128D-01XA0_A00**

Approved By Customer:

Date:

Approved By	Checked By	Prepared By

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1. Precautions in Use of LCD Module

(1) Avoid applying excessive shocks to the module or making any alterations or modifications to it.
(2) Don't make extra holes on the printed circuit board, modify its shape or change the components of LCD Module.
(3) Don't disassemble the LCM.
(4) Don't operate it above the absolute maximum rating.
(5) Don't drop, bend or twist LCM.
(6) Soldering: only to the I/O terminals.
(7) Storage: please storage in anti-static electricity container and clean environment.

2. General Specification

ITEM	STANDARD VALUE	UNIT
Number of dots	240X128	Dots
Outline dimension	144.0(W)X104.0(H)X13.0MAX.(T)	mm
View area	114.0(W)X64.0(H)	mm
Active area	107.95(W)X57.55(H)	mm
Dot size	0.40(W)X0.40(H)	mm
Dot pitch	0.45(W)X0. 45 (H)	mm
LCD type	STN,Yellow-Green,Positive,transflective	
View direction	6 o'clock	
Backlight	LED, Yellow-Green	
Controller	LC7981	
Interface	8-bit parallel	

3. Absolute Maximum Ratings

ITEM	SYMBOL	MIN.	TYPE	MAX.	UNIT
Operating Temperature	T_{OP}	-20	-	+70	℃
Storage Temperature	T_{ST}	-30	-	+80	℃
Input Voltage	V_I	-0.3	-	V_{DD} +0.3	V
Supply Voltage For Logic	V_{DD}	0	-	5.5	V
Supply Voltage For LCD	V_{DD}-V_{EE}	0	-	20.0	V

4. Electrical Characteristics

ITEM	SYMBOL	CONDITION	MIN.	TYPE	MAX.	UNIT
Logic Voltage	V_{DD}-V_{SS}	-	4.5	5.0	5.5	V
Supply Volt.For LCD	V_{DD}-V_O	Ta=25℃	---	18.0	---	V
Input High Volt.	V_{IH}	-	V_{DD} -2.2	-	V_{DD}	V
Input Low Volt.	V_{IL}	-	0	-	0.8	V
Output High Volt.	V_{OH}	-	V_{DD} –0.3	-	V_{DD}	V
Output Low Volt.	V_{OL}	-	0	-	0.3	V
Supply Current	I_{DD}	-	---	20.0	---	mA

5. Backlight Information

Absolute Maximum ratings (Ta=25℃)

Item	Symbol	Conditions	Rating	Unit
Reverse voltage	Vr	-	5.0	V
Reverse Current	I_r	Vr=5.0V	80	uA
Absolute maximum forward Current	Ifm		180	mA
Peak forward current	Ifp	I msec plus 10% Duty Cycle	240	mA
Power dissipation	P_d		380	mW
Operating Temperature Range	T_{oper}		-30~+80	℃
Storage Temperature Range	Tst		-40~+90	℃

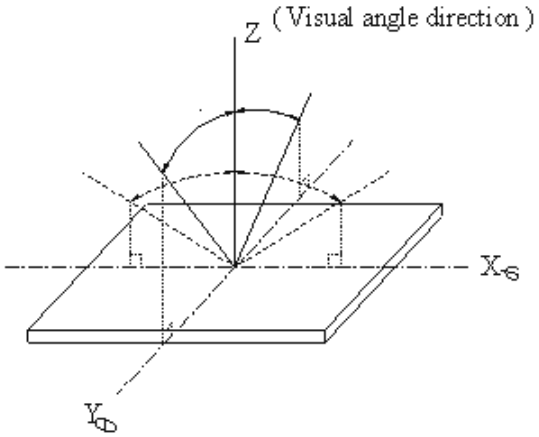
Electrical/Optical Characteristics (Ta=25^{0}C,If=160mA)

Color	Wavelength λp(nm)	Spectral line half width Δλ (nm)	Operating Voltage(v) (±0.15V)	Forward Current (mA)
Yellow-Green	---	---	3.1	120

6. Optical Characteristics

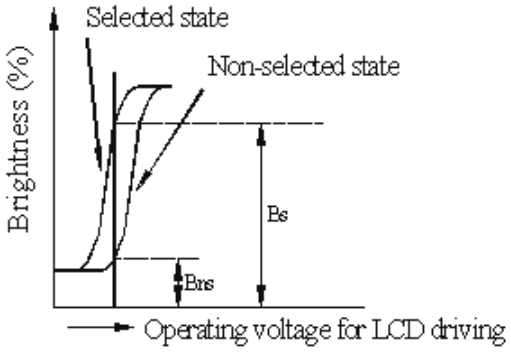
ITEM	SYMBOL	CONDITION	MIN	TYPE	MAX	UNIT
View Angle	(V) θ	CR≧2	10	–	120	deg.
	(H) ϕ	CR≧2	-45	–	45	deg.
Contrast Ratio	CR	–	–	5	–	–
Response Time	T rise	–	–	200	300	ms
	T fall	–	–	150	200	ms

■View Angles

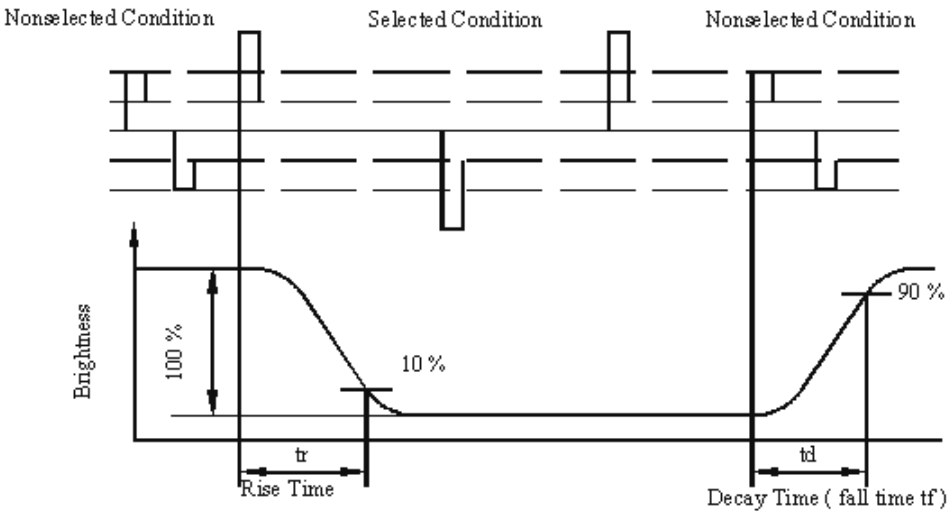


■Contrast Ratio

$$CR = \frac{\text{Brightness at selected state (BS)}}{\text{Brightness at non-selected state (Bns)}}$$



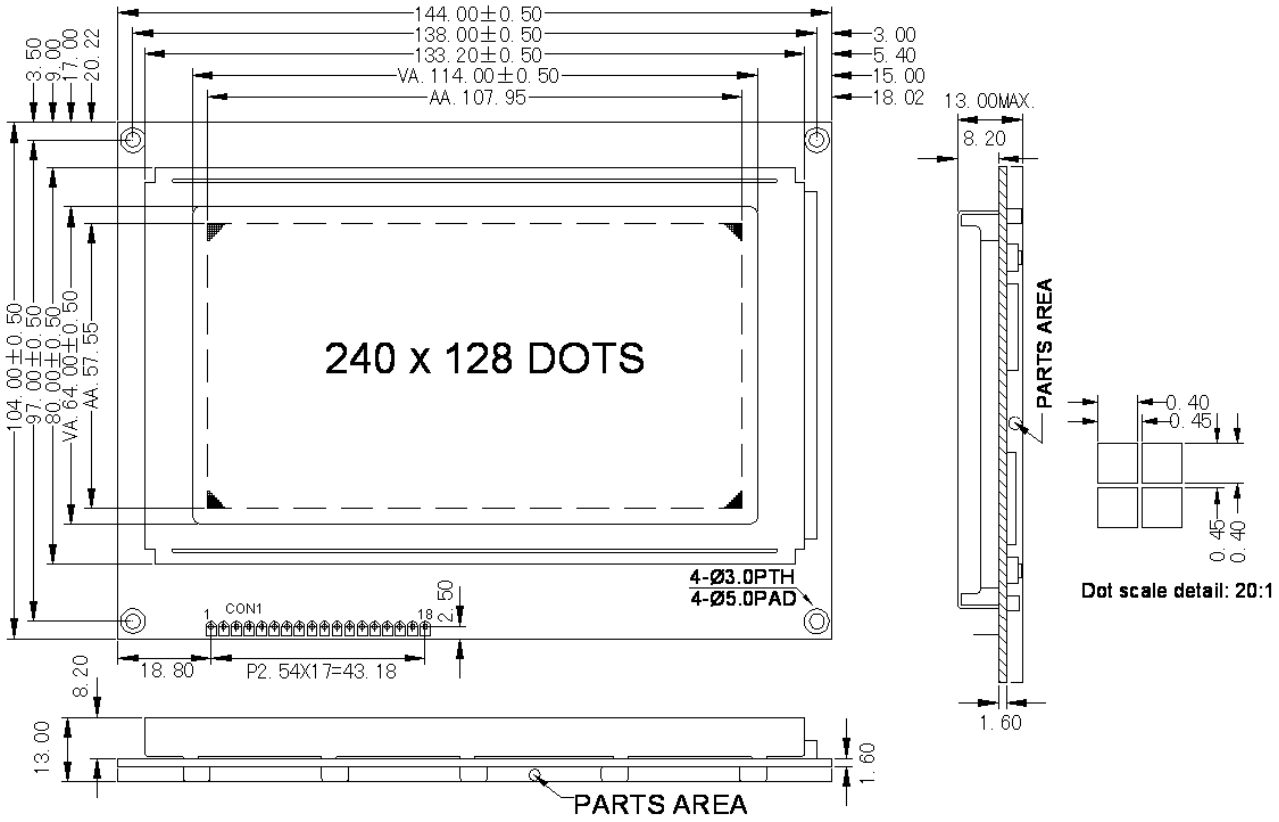
■Response time

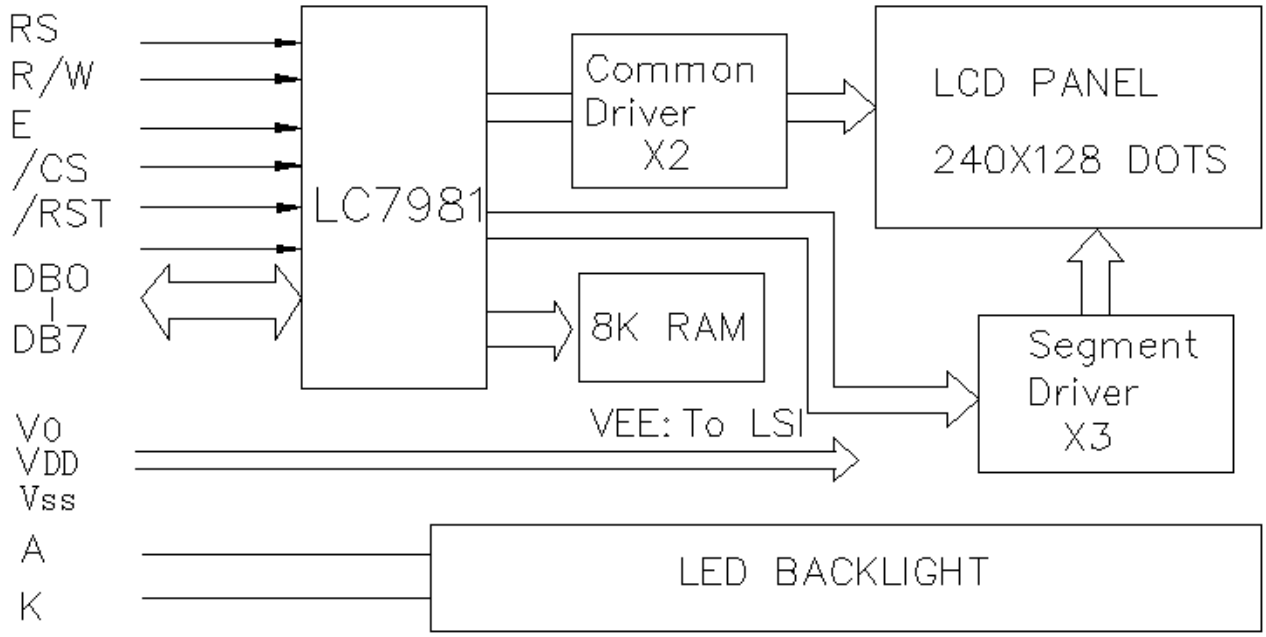


7.Interface Description

Pin No.	Symbol	Level	Description
1	V_{SS}	0V	Ground
2	V_{DD}	5.0V	Power supply for Logic
3	V0	Variable	Input Negative voltage for LCD
4	RS	H/L	H :Command L:Data
5	R/W	L	Write signal,active LOW
6	E	L	Read signal,active LOW
7~14	DB0~DB7	H/L	8-bit Data bus
15	/CS	L	Chip enable,active LOW
16	/RST	L	LCM reset,active LOW
17	A(LED+)	+5V	Anode of LED Backlight
18	K(LED-)	0V	Cathode of LED Backlight

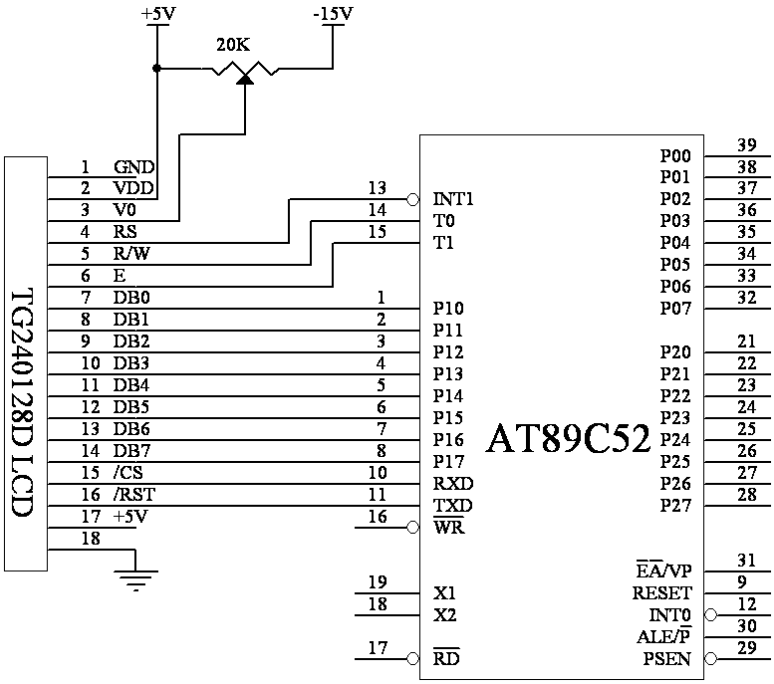
8. Contour Drawing & Block Diagram





9. Application circuit

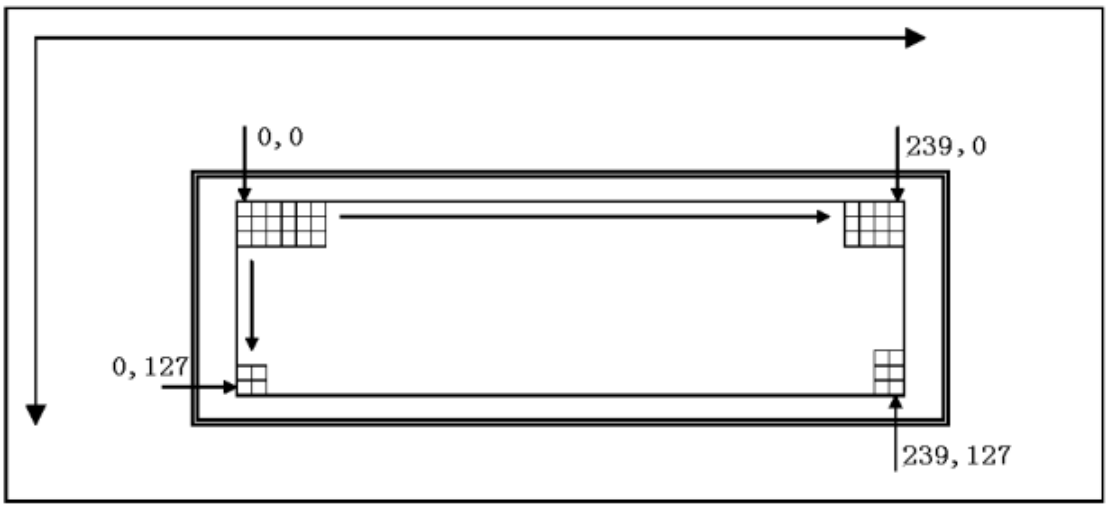
9.1 Interfaces with the 6800-series MPU

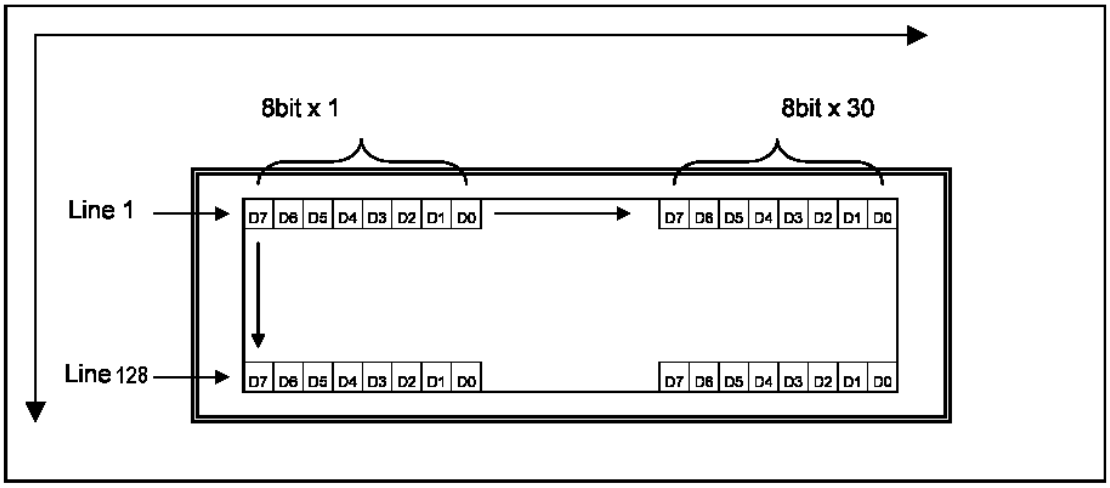


10. LCD Function Description

The LCD built-in Sanyo LC7981. LC7981 is controller LSI for the liquid crystal dot matrix graphic display.
*For more detail features, please refer to LC7981 user manual

11. LCD RAM map





12. Standard Character pattern

13. Revision records

Version	Ref.pages	Revision Items	Date
A00	All	New release	2011.12.19